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ANXIETY, DEPRESSION, AND FUNCTIONAL STATUS ARE THE BEST PREDICTORS OF HEALTH STATUS FOR PATIENTS WITH HEART FAILURE

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Title Anxiety, Depression, and Functional Status are the Best Predictors of Health Status for Patients with Heart Failure

Disclaimer Statement: The opinions or assertions contained herein are the private views of the authors and are not to be construed as official or as reflecting the views of the Department of the Air Force or the Department of Defense.

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Background and Significance
- Heart failure (HF) has reached epidemic levels.
- Health status important in management of HF.
- Symptomatic patients more concerned about their everyday health status than the length of their life.
- Health status encompasses health-related quality of life (HRQL), physical activity level (functional status), and symptom burden.
- Clinicians usually focus only on sociodemographic and physiologic determinants of health status. Investigators often conduct intervention studies that are designed to reduce mortality without regard to health status. Thus, health status is poorly understood for patients with HF.

Purpose The purpose of this study was to identify subjective predictors of health status, controlling for sociodemographic and clinical variables.

Methods
- *Design* Descriptive, correlational sub-study of a prospective, randomized clinical trial in which the dose of disease management needed to improve outcomes in patients with heart failure was determined.
- *Sample Inclusion Criteria*
  - ➤ Hospitalized with HF.
  - ➤ New York Heart Association (NYHA) class II to IV HF.
  - ➤ At risk for heart failure rehospitalization.
  - ➤ No dementia, serious cognitive impairment, or psychiatric illness.
- *Settings* Three urban and suburban community hospitals located in the Midwest; Institutional Review Board approval obtained at all sites.
- *Predictor Variables and Instruments*
  - ➤ Sociodemographic variables: Age, gender, living arrangement.
  - ➤ Clinical variables: NYHA class, ejection fraction; history of CAD, AMI, PCI, or CABG.
  - ➤ Health perception: Item from Short Form-36 – valid and reliable.
  - ➤ Emotions: Anxiety, depression, hostility subscales of the Brief Symptom Inventory – sensitive, brief, reliable, and valid; does not rely on physical symptoms of emotions.

- *Outcome Variables*
  - <u>Health-related quality of life</u>: Minnesota Living with Heart Failure Questionnaire – developed specifically to measure HRQL in HF patients; valid and reliable; addresses physical and emotional impairments.
  - <u>Actual physical activity level</u>: Mini Mitter Actigraph – continuous and objective measure of activity level for 24 hours; reliable and valid; high degree of subject acceptability.
  - <u>Symptom burden</u>: Dyspnea Fatigue Index – developed to assess the degree to which the symptoms of dyspnea and fatigue impact daily life; reliable and valid.
- *Data Analysis*
  - Bivariate: Spearman rho correlations
  - Multivariate: Separate hierarchical multiple regression models for three indicators of health status
    - Step 1: Demographic variables: age, gender, living alone
    - Step 2: Clinical variables: NYHA class, EF, comorbidity
    - Step 3: Health perception: current health
    - Step 4: Emotional variables: anxiety, depression, hostility
  - Diagnostics: No multicollinearity problems based on variable inflation factor and tolerance values

Results
- Sample characteristics: Table 1
- Clinical characteristics: Table 2
- Worse NYHA class, higher anxiety, and higher depression predicted worse HRQL, explaining 37% of the variance (Table 5).
- Better NYHA class and higher anxiety predicted higher levels of physical activity and explained 17% of the variance (Table 6).
- Worse NYHA class and higher depression predicted greater symptom burden, explaining 52% of the variance (Table 7).

Conclusions
- Three strongest predictors of health status were NYHA class, anxiety, and depression.
- Although not routinely assessed clinically, emotional variables have major impact on health status.
  - Clinicians can assess anxiety and depression using a short instrument such as the BSI which non-psychiatrist clinicians can easily administer and interpret.
- Interventions designed to improve health status should target not only physical, but also emotional well-being.

Limitations
- Sample size.
- Convenience sample.
- Data collected at one time point.

- Variables such as social support or perceived control may have influenced health status.

Table 1 Selected Sociodemographic Characteristics (N = 87)

Characteristic	Mean ± SD or %
Age (years)	72.5 ± 10.8
Education (years)	12.0 ± 2.6
Female gender	42 (48.3%)
Lives alone	39 (44.8%)
White ethnicity	77 (88.5%)

Table 2 Clinical Characteristics (N = 87)

Characteristic	Mean ± SD or %
LVEF, %	38.2 ± 15.0
NYHA Classification	
II	41 (47.1%)
III	41 (47.1%)
IV	5 (5.7%)
History CAD	61 (70.1%)
History of AMI	33 (37.9%)
History PTCA	15 (17.2%)
History CABG	30 (34.5%)
History HTN	65 (74.7%)

Table 3 Health Perception and Emotional Variables (N = 87)

Characteristic	%
Poor or fair health perception	51.5%
Anxious	72.3%
Depressed	73.3%
Hostile	66.3%

Table 4 Outcome Variables (N = 87)

Characteristic	Mean ± SD
Health-related quality of life	51.62 ± 22.58
Physical activity level	181,808.79 ± 88,034.75
Symptom burden	5.04 ± 2.29

Table 5 Hierarchical Multiple Regression of Variables Associated With Health-Related Quality of Life for Persons with Heart Failure

Predictor Variables	F	Adjusted R^2	Standardized Beta[a]	P Value
Step 1 *Demographic Variables*	2.24	.04		
Age			-.19	.08
Gender			.01	.89
Living alone			.08	.38
Step 2 *Clinical Variables*	4.59*	.20		
NYHA class			.21	.05*
Ejection fraction			.15	.11
Comorbidity			.10	.29
Step 3 *Health Perception*	5.06*	.25		
Current health			.13	.23
Step 4 *Emotional Variables*	6.09*	.37		
Anxiety			.25	.03*
Depression			.21	.05*
Hostility			.09	.45

*p ≤ .05; [a]Betas shown are for step 4

Table 6 Hierarchical Multiple Regression of Variables Associated With Physical Activity Level for Persons with Heart Failure

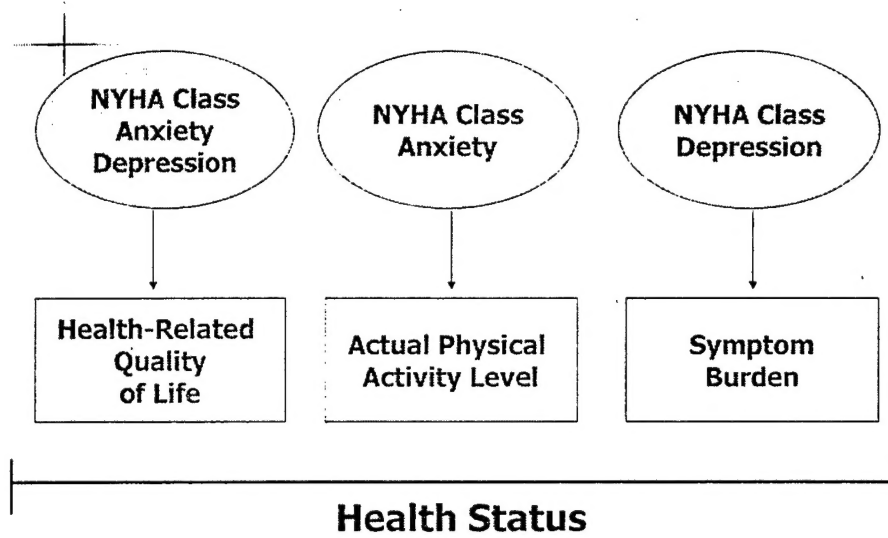| Predictor Variables	F	Adjusted R^2	Standardized Beta[a]	P Value
Step 1 *Demographic Variables*	2.70	.06		
Age			-.10	.42
Gender			.11	.32
Living alone			.11	.29
Step 2 *Clinical Variables*	2.54*	.10		
NYHA class			-.35	.005*
Ejection fraction			-.004	.97
Comorbidity			.10	.35
Step 3 *Health Perception*	2.31*	.10		
Current health			.08	.51
Step 4 *Emotional Variables*	2.75*	.17		
Anxiety			.30	.02*
Depression			-.20	.11
Hostility			.11	.41

$p \leq .05$; [a]Betas shown are for step 4

Table 7 Hierarchical Multiple Regression of Variables Associated With Symptom Burden for Persons with Heart Failure

Predictor Variables	F	Adjusted R^2	Standardized Beta[a]	P Value
Step 1 *Demographic Variables*	2.19	.04		
Age			-.12	.19
Gender			.12	.16
Living alone			.03	.67
Step 2 *Clinical Variables*	12.80*	.45		
NYHA class			-.52	.001*
Ejection fraction			-.05	.57
Comorbidity			.15	.07
Step 3 *Health Perception*	11.20*	.45		
Current health			.02	.86
Step 4 *Emotional Variables*	10.24*	.52		
Anxiety			-.07	.45
Depression			-.18	.05
Hostility			-.18	.09

$p \leq .05$; [a]Betas shown are for step 4

Summary of Predictors

NYHA Class
Anxiety
Depression

NYHA Class
Anxiety

NYHA Class
Depression

Health-Related
Quality
of Life

Actual Physical
Activity Level

Symptom
Burden

Health Status

Title: Anxiety, depression, and functional status are the best predictors of health status for patients with heart failure

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Purpose: Although mortality related to heart failure (HF) is high, the number of patients living with HF increases annually. Therefore, health status is an increasingly important concept in the management of HF. In fact, most symptomatic patients are more concerned about their everyday health status than the length of their life. Yet, most investigators conduct intervention studies that are designed to reduce mortality. As a result, health status is poorly understood for patients with HF. Thus, the purpose of this study was to identify predictors of health status.

Method: In this correlational study, we interviewed 87 patients (age 73 ± 11 years; 48% female; ejection fraction [EF] 38 ± 15%; New York Heart Association [NYHA] class III/IV 53%) immediately prior to discharge from a hospitalization for HF. Health status was conceptualized as health-related quality of life [HRQL] (measured using the Minnesota Living with Heart Failure Questionnaire), actual physical activity level (measured over 24 hours using the Mini Mitter actigraph), and level of symptom burden (measured using the Dyspnea-Fatigue Index). Hierarchical multiple regression techniques were used to determine sociodemographic (sex, age, living alone), clinical (comorbidities, NYHA class, EF), health perception, and emotional (anxiety, depression, and hostility measured using the Brief Symptom Inventory) variables associated with health status.

Results: Worse NYHA class, higher anxiety, and higher depression predicted worse HRQL, explaining 37% of the variance. Better NYHA class and higher anxiety predicted higher levels of physical activity and explained 17% of the variance. Worse NYHA class and higher depression predicted greater symptom burden, explaining 52% of the variance. Based on the standardized beta coefficients, the three strongest predictors of health status were anxiety, NYHA class, and depression.

Conclusion: Although emotional variables are not routinely assessed clinically, clearly they have a major impact on health status. Data from this study demonstrate that most traditional demographic and clinical variables assessed by clinicians are not associated with health status. Interventions to improve health status should target not only physical, but also emotional, well-being.